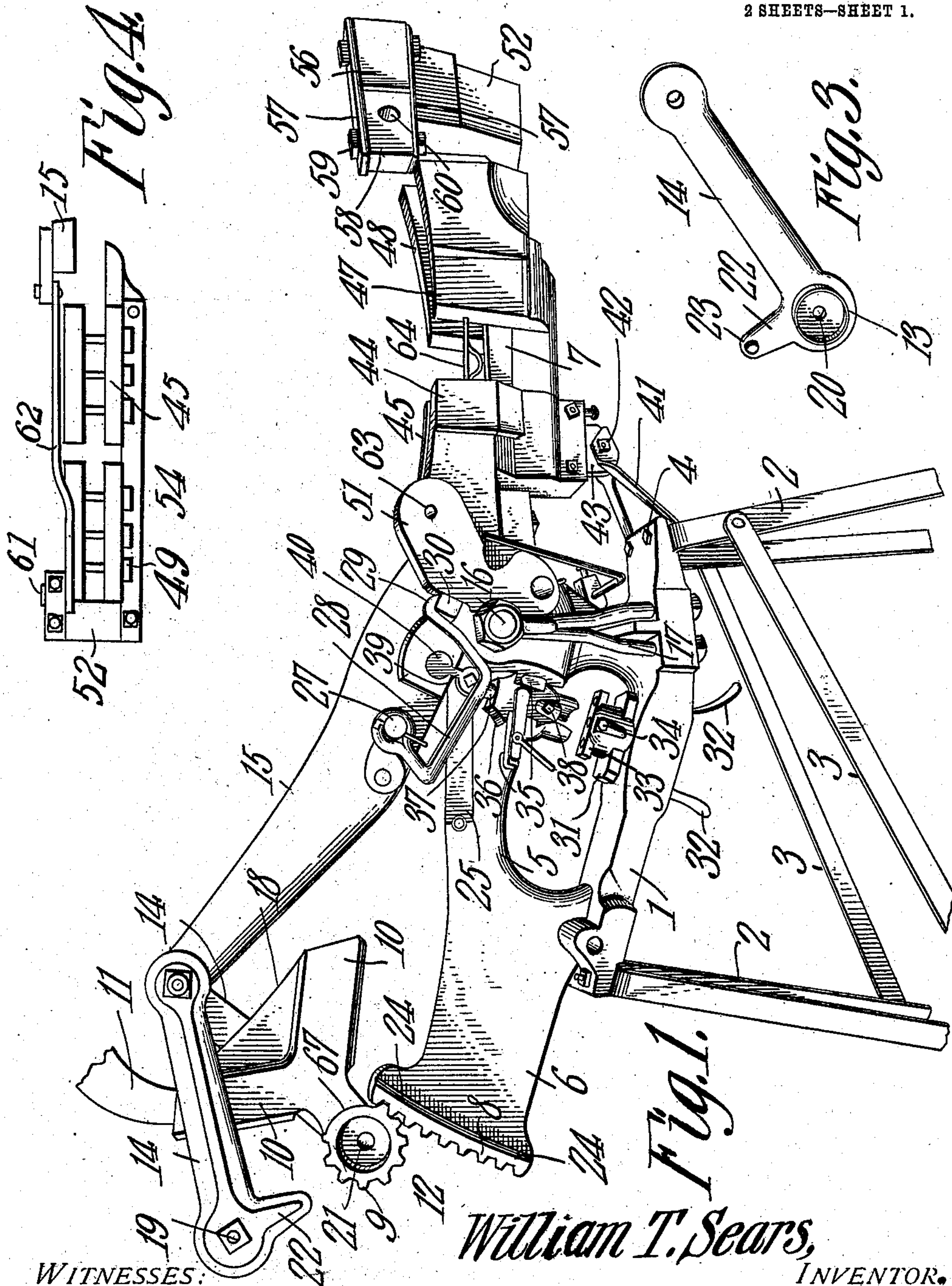


W. T. SEARS.  
CUTTING, PUNCHING, AND TIRE SHRINKING MACHINE.  
APPLICATION FILED JUNE 20, 1907.

900,213.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.



WITNESSES:

*E. J. Chapman*  
F. J. Chapman.

William T. Sears,  
INVENTOR.

By *C. A. Snow & Co.*  
ATTORNEYS

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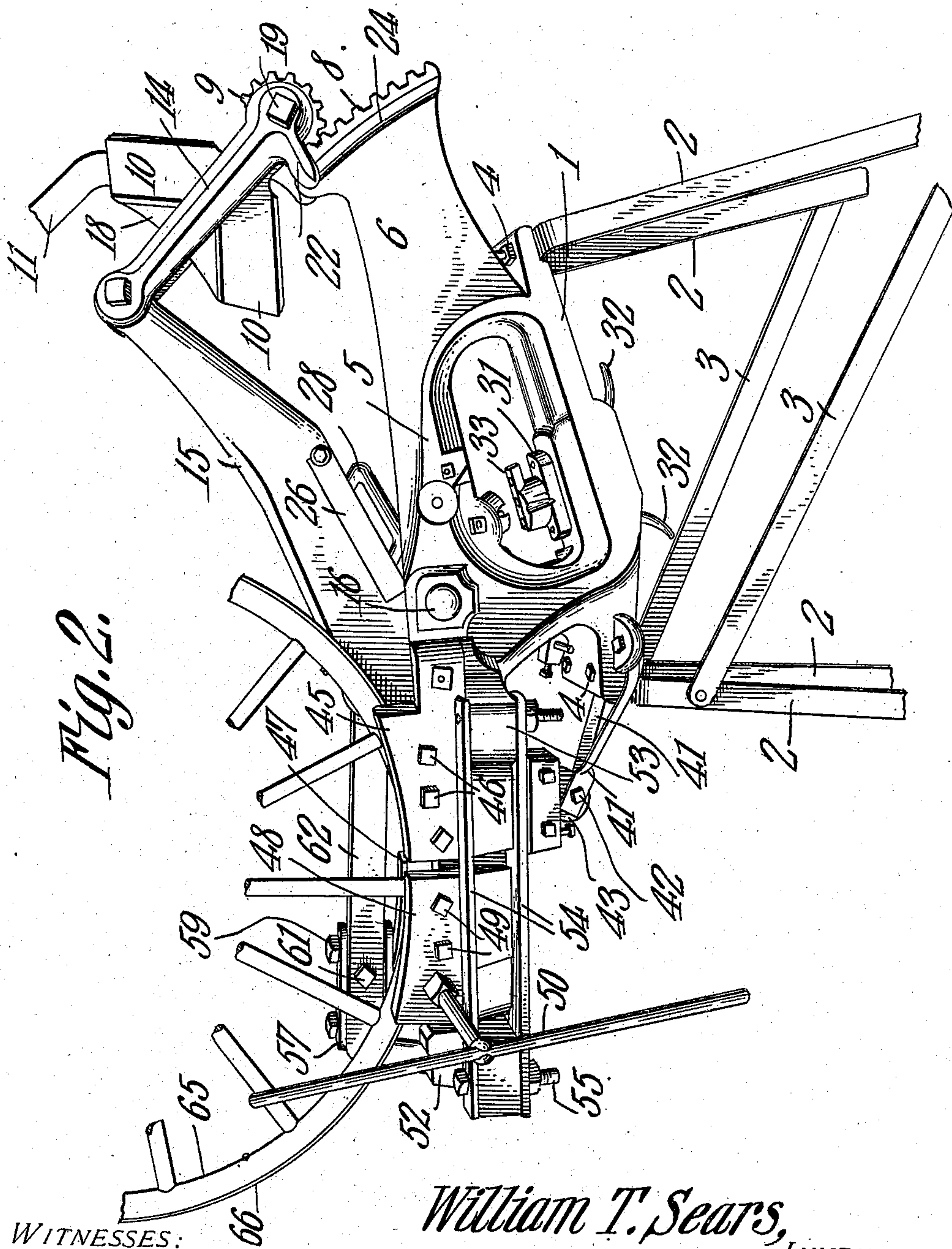


Fig. 2.

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# UNITED STATES PATENT OFFICE.

WILLIAM T. SEARS, OF ONSLOW, IOWA.

## CUTTING, PUNCHING, AND TIRE-SHRINKING MACHINE.

No. 900,213.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed June 20, 1907. Serial No. 379,998.

*To all whom it may concern:*

Be it known that I, WILLIAM T. SEARS, a citizen of the United States, residing at Onslow, in the county of Jones and State of Iowa, have invented a new and useful Cutting, Punching, and Tire-Shrinking Machine, of which the following is a specification.

This invention has reference to improvements in combined cutting, punching and tire-shrinking machines, designed more especially for shop use.

The invention consists essentially of a suitable stand upon which are mounted stationary and movable shear-blade carrying arms, which arms also carry the two members of a suitable punch, and in addition thereto there is provided a tire-shrinking device connected to and movable by the same mechanism operating the shear-blades and punch.

The invention will be fully understood from the following detailed description, taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a perspective view of the machine as seen from one side, certain parts being omitted; Fig. 2 is a perspective view from the other side of the machine, showing the tire-shrinking mechanism in place; Fig. 3 is a detail view. Fig. 4 is a view showing the plan of the clamping jaws and operating mechanism therefor.

Referring to the drawings, there is shown a bench or base piece 1 mounted upon legs 2, which latter may be made of strap iron suitably connected by braces 3. By making the legs of strap iron each pair of legs may be made in one piece appropriately bent at a middle point and connected to the base 1 by bolts 4. Cast on the base 1 is an arch 5 extended in one direction to form an arm 6 beyond the base 1 and extending in the other direction to constitute the stationary portion 7 of the tire-upsetting mechanism to be hereinafter referred to.

The outer end of the arm 6 is formed into an arc-shaped gear segment 8 engaged by a pinion 9 formed in one piece with sockets 10 for the reception of a lever handle 11. The pinion 9 is countersunk on each side, as indicated at 12, to receive a boss 13 on the end of a link 14 fast on the end of an arm 15 pivoted to the arch 5 by a through bolt 16 fast to the arch 5 at one end and supported beyond the arm 15 by a brace 17 having its

lower end bifurcated and securely bolted to the base piece 1.

Returning to the pinion 9 and sockets 10, it may be observed that the sockets are braced by a connecting web 18 and that the pinion 9 is engaged on each side by the bosses 13, while a through bolt 19, passing through perforations 20 in the two links 14 and a perforation 21 in the pinion 9, serves as a journal for the pinion. When the handle 11 is inserted in one of the sockets 10 and moved in an appropriate direction with the bolt 19 as a pivot or fulcrum, the pinion 9, which is in mesh with the gear segment 8, will move down the gear segment, assuming the parts to be in the position shown in the figures, and the arm 15 will be turned around the bolt 16 as a fulcrum and be caused to approach the arch 5. The second socket 10 is provided so that a greater range of movement may be imparted to the pinion 9 and arm 15 than could be conveniently obtained were only one socket provided. Each link 14 is provided with an offset 22 at the boss end and this offset may be provided with a lug 23 arranged to engage behind a ledge 24 back of the gear segment 8, so that the pinion 9 is constrained to travel over the gear segment 8 with its teeth in mesh with the teeth of said segment.

Fast on the top of the arch 5 is a shear-blade 25 and fast on the arm 15 is another shear blade 26, positioned to coact with the shear-blade 25 so that any material placed between the shear-blades will be cut by the same when the arm 15 is caused to approach the arch 5. On the opposite side of the arm 15 from that carrying the shear-blade 26 there projects a stud 27 on which is pivoted one end of a U-shaped frame 28, the other end of which is formed into a hook 29 engaging a lug 30 formed on an appropriate portion of the arm 15. This frame 28 serves as a hold-down member for the material cut by the shear-blades 25—26.

On the base member 1 is secured a block 31 which may be secured in place by suitable bolts with nuts having handles 32 by means of which the nuts are manipulated. In the drawings only the handles 32 are shown, since these handled nuts are a common means of securing movable members in place and need no description. Removably secured to the block 31 is a die block 33 by means of a set-screw 34, or otherwise. The arch 5, above the block 31, is formed with



lugs 35 between which is seated a block 36 receiving and guiding a longitudinally movable punch holder 37, the lower end of which is shaped to receive a suitable punch, holding the latter by means of a set-screw 38. The upper end of the punch holder 37 is connected by a link 39 to a head 40 which may be seated in a suitable perforation or socket in the arm 15. Now, when the arm 15 is moved about its pivotal support the punch holder 37 may be moved longitudinally through the intermediary of the link 39, which link permits the change of motion between the arc described by the head 40 and the rectilinear movement of the punch holder 37. Any material placed upon the die plate 33 will be operated upon by a punching tool held in the punch holder 37 when the lever handle 11 is operated in the same manner as it is to cause the shear-blades to be brought together.

The beam 7 is supported near one end by brackets 41 which may be secured to the base 1 by the bolts 4 and which are secured at the other end by a bolt 42 to an ear 43. The beam 7 carries the jaws of the tire-upsetter. One pair of jaws 44—45 may be in immovable relation to the beam 7 except that the jaw 45 is secured to the jaw 44 by bolts 46 so that when a tire is placed between these jaws it may be firmly clamped by the tightening of the bolts 46. Carried upon the beam 7 are other jaws 47—48 connected together by bolts 49. In Fig. 2 is shown a bolt wrench 50 of the socket type, which may be used to tighten the bolts 46 and 49 or to loosen the same in order to clamp or unclamp the tire. The two pairs of jaws may have their contiguous faces, where they grasp the tire, provided with suitable gripping surfaces such as are commonly used for such purposes, and these gripping surfaces may or may not be removable, as desired. The jaws 47 and 48 are so constructed that after the tire is clamped between them these jaws may be moved on the beam 7 toward the other jaws 44—45. For this purpose the arm 15 is provided with an angle extension 51, and beyond the jaws 47—48 the beam 7 carries a block 52. On the fixed structure of the machine adjacent to the junction between the arch 5 and beam 7 there is formed a lug 53, and secured to this lug are straps 54 extending and pivotally connected to the block 52 by a bolt 55. These straps 54 are on one side of the jaws 45 and 48, while the said block 52 is formed on the side opposite to that connected to the straps 54 with an offset 56. Connected to this offset 56 by short, strap links 57 is a block 58 pivotally supported in said links by a bolt 59. This block 58 is provided with a through perforation 60 for the reception of a bolt 61 connecting to it a link 62 extending to the angle extension 51, which is provided with a per-

foration 63 for a suitable bolt connection with the link 62. Now, when the arm 15 is moved in a direction to cause it to approach the arch 5 the angle extension 51 is moved away from the block 52, but because of the link connection 62 the corresponding end of the block 52 is constrained to move with the angle extension 51 in the same direction. However, the other end of the block 52 is held by the straps 54, and, therefore, the block 52 operates as a short lever acting upon the jaws 47—48. Since these jaws are movable upon the beam 7 toward the other jaws 44—45, the movement of the block 52 will cause the approach of the two pairs of jaws. A tire clamped between these two pairs of jaws is therefore upset by the approach of the jaws. In order, however, to prevent the tire from buckling a rest 64 is inserted between the tire and the beam 7 under that portion of the tire included between the two sets of jaws.

In order to illustrate the operation of the tire-upsetting devices there is shown in Fig. 2 of the drawing a small section of a wheel 65 with its tire 66 in place.

It will be seen that a person grasping the handle 11 will cause the same to pass through a long path to cause a slight movement of approach between the fixed jaws 44—45 and the movable jaws 47—48. Therefore, a great force may be exerted to cause the upsetting of a tire with comparatively little effort on the part of the operator.

The structure described is particularly applicable to places where the different operations provided for by the machine are desirable. Hence the structure is of great use in blacksmith shops, where the upsetting or taking up of loosened tires, and the punching and shearing of metal, are operations frequently performed, and by the structure of this invention these several operations are combined in one machine and under the control of one set of operating parts.

It will be observed that the sockets 10—10 are arranged at a suitable angle to each other, and when the arm 15 is in the uppermost position both of these sockets are to one side of the vertical plane cutting the axis of the pinion 9; that is, these sockets overhang the arm 6. The weight of the sockets is such that they tend to rotate the pinion 9 still further in a direction to elevate the arm 15, but the pinion 9 is of the mutilated type with the teeth omitted for a portion of its circumference, as indicated at 67, and this smooth portion 67 is arranged to engage the uppermost tooth of the toothed segment or gear 8 and stop the pinion 9 from further rotation in that particular direction. When the parts are in this position the weight of the sockets 10 serves to lock the parts, so that there is no danger of the arm 15 approaching the arch 5 when not so desired.



(When, however, the handle 11 is manipulated in a direction to cause the arm 15 to approach the arch 5, and to also cause the punch or tool holder 37 to approach the die plate 33, and to cause the approach of the tire-upsetting jaws, then the weight of the sockets 10 assists the operator in bringing about the several operations described.

I claim:—

10 1. In a device of the class described, a fixed or bed member provided with a rack or gear teeth at one end and ledges adjacent to said gear teeth, a pivoted arm carried by the bed member, links carried by the end of the pivoted arm and having lugs formed on their free ends engaging behind the ledges on the bed member, and a pinion engaging the gear teeth and carried by the free ends of the links, said pinion having divergent  
15 sockets formed thereon, one of said sockets being adapted to over-ride the end of the bed member and extend between the links and thereby constitute a weighted extension

for said pinion constrained by gravity to hold the pinion in inactive position. 25

2. In a device of the class described, a fixed or bed member, a pivoted member carried thereby and having an angle extension on one side of the pivot, a pair of clamping jaws carried by the bed member, another pair of clamping jaws carried by the bed member and movable with relation to the first pair of jaws, a lever engaging the end of the movable jaws remote from the fixed jaws, links connecting one end of the lever to the bed plate, and other link connections between the other end of said lever and the angle end of the pivoted arm. 30 35

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses. 40

WILLIAM T. SEARS.

Witnesses:

HARRY H. HALL,  
M. B. WALTERS.